

## REMARKS

The Office Action of October 5, 2006 has been received and its contents carefully considered.

The present Amendment corrects an informality that has been detected in claim 7. It also adds new dependent claims 11-16 to further protect the invention. These new claims are supported by Figure 4 of the application's drawings, and the discussion of Figure 4 that is presented in the specification.

The present application includes two independent claims, claims 1 and 7. Section 2 of the Office Action rejects both of these independent claims for anticipation by US patent 5,426,671 to Bergmans. The rejections are respectfully traversed for the reasons discussed below.

Claim 1 is directed to a method of timing recovery, and comprises the steps of "providing current sampling points for a received signal to generate current symbols according to **a timing scheme**;" and "detecting optimal points of the current symbols...". Bergmans' arrangement is considerably different. In Bergmans' Figure 1 (the same Figure that is reproduced on the cover sheet of the reference), the output of an equalizer 14 is sampled by samplers 16 and 20 at **two separate sampling instances**, and these two symbol samples are supplied respectively to decision circuits 26 and 30 (see column 8 of the reference lines 22-29). As is indicated in Bergmans' Figure 1, as well as in the abstract of the reference, the transmitted signal is the sum of different signal elements of two groups of symbols. At Bergmans' receiver, the received signal is sampled at first and second sampling instances for every two successive signal elements. However, the techniques disclosed in the present application do not have such a limitation on the transmitted signal.

The symbol sampler 302 shown in Figure 3 of the present application's drawings samples the output of a match filter 300 at a preset sampling rate, as shown (for example) in Figure 4. In the example shown in Figure 4, the sampling rate is eight samples per sample.

In addition, the decision making mechanisms shown in Bergmans' Figures 3 and 4 are closely related to the relationship between the groups of symbols (see column 9,

lines 13-18). Bergmans' decision mechanism needs input signals  $S_c$  in order to make decisions according to formula (5) of the reference.

From the foregoing, it will be apparent that Bergmans discloses two separate timing schemes, instead of "providing current sampling points... according to a **timing scheme**" in accordance with claim 1. The rejection of claim 1 should therefore be withdrawn.

Similar comments apply with respect to independent claim 7. Bergmans discloses two separate signal paths to his phase detector 28 (error detector), mainly, one signal path includes sampler 16 and decision circuit 26 and another signal path includes sampler 20 and decision circuit 30. The sampled signals from each path are taken at **two separate sampling instances**. The reference does not suggest the symbol sampler recited in claim 7, which samples a received signal "at current sampling points according to a **timing scheme**."

The remaining claims depend from the independent claims discussed above and recite additional limitations to further define the invention. They are therefore patentable along with their independent claims for that reason alone. Nevertheless, several dependent claims will now be briefly addressed.


In claim 3, filtering of timing differences comprises "convolution and accumulation of the timing differences." Although Bergmans may teach low-pass filtering to average the timing error, the reference does not do this for the purpose expressed in claims 1 and 2 (from which claim 3 depends). The Zierhofer reference (US patent 6,182,103) discloses a filter that employs convolution and accumulation for speech recognition, but an ordinarily skilled person would not have had an incentive to incorporate Zierhofer's teachings into the Bergmans' arrangement for a low-pass filter.

New dependent claims 11 and 14 provide that "the current sampling points are selected from a sequence of potential sampling points for each symbol and the optimal sampling points are the potential sampling points for each symbol at which the amplitude at the received signal has the highest absolute value." Bergmans does not suggest examining a signal at potential sampling points to detect the largest absolute value.

New dependent claims 12 and 14 provide that "the sequence of potential sampling points for each symbol includes more than two potential sampling points for each symbol," contrary to Bergmans, and new dependent claims 13 and 16 provide that there are about eight potential sampling points for each sample. This is far a field from what is disclosed in the Bergmans reference.

For the foregoing reasons, it is respectfully submitted that this application is in condition for allowance. Reconsideration of the application is therefore respectfully requested.

Respectfully submitted,

A handwritten signature in cursive script that reads "Allen Wood". The signature is written in dark ink and is positioned above a horizontal line.

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